

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 35

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEENDERT DORST and KAREN I. TROVATO

Appeal No. 1998-1733
Application No. 07/617,303

ON BRIEF

Before THOMAS, KRASS and BARRY, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-15, 17-23 and 33. Claims 24-26 and 29-32 have been indicated by the examiner to be directed to allowable subject matter and are not before us on appeal.

The invention is directed to a method and apparatus for planning a path with regard to moving objects. The invention is embodied in software for creating, in a

computer memory, a configuration space data structure representing a physical task

space that surrounds a physical object. Cost waves are propagated in the space data structure in order to fill the structure with cost values. Each state, along permissible directions of travel, is assigned a cost value and a direction of travel corresponding to a physical least cost path from a starting point to a goal point. A series of discrete states along the physical path is determined, which is then usable by a physical object to follow the physical path.

This case, along with a related case, Application Serial No. 07/508,024, has had a long and torturous prosecution history. Instant claims 1-15, 17-23 and 33 have been previously appealed to this Board and a decision was rendered in that case on May 26, 1993 wherein the examiner's decision rejecting the claims as being directed to nonstatutory subject matter under 35 U.S.C. § 101 was affirmed-in-part, sustaining the rejection with regard to claims 1-23 and 33 but not sustaining the rejection as to claims 24-26. Thus, the rejection, under 35 U.S.C. § 101, of all of the claims presently before us in the instant case was sustained in our earlier decision. On appeal to the Court of Appeals for the Federal Circuit, our reviewing court affirmed the decision of the Board in this case, as well as in the companion case, on December 19, 1994 (In re Trovato,

42 F.3d 1376, 33 USPQ2d 1194 (Fed. Cir. 1994)). Then, in a decision of July 25, 1995,

the Court of Appeals for the Federal Circuit vacated its original decision of December 19, 1994 and remanded this application for reconsideration in view of the new guidelines adopted by the U.S. Patent and Trademark Office for examination of computer-related inventions. On remand and reconsideration, the examiner again rejected the claimed subject matter, as to claims 1-15, 17-23 and 33, under 35 U.S.C. § 101 as being directed to nonstatutory subject matter and this appeal followed.

Representative independent claim 1 is reproduced as follows:

1. A method for determining at least one physical motion specification for a physical object comprising executing the following steps in at least one digital data processing device and at least one computer readable storage medium that is included in or coupled with the at least one digital data processing device:

a) embodying, in the at least one computer readable storage medium, a configuration space data structure representing a physical task space that surrounds the physical object in physical reality, the configuration space data structure including signals representing the physical object and the physical task space; and

b) propagating cost waves, in the configuration space data structure, to fill the configuration space data structure with cost values according to a space variant metric, the cost values representing physical aspects of the physical task space with respect to the physical motion of the physical object.

No references are relied upon.

Claims 1-15, 17-23 and 33 stand rejected under 35 U.S.C. § 101 as being

directed to nonstatutory subject matter. The examiner contends that the claimed invention is directed to a mathematical algorithm with insignificant pre- and post-solution activity. Reference is made to pages 4-15 of the answer for the examiner's complete explanation of the rejection.

Reference is made to the brief and answer for the respective positions of appellants and the examiner.

OPINION

The previous Board decision, as well as the vacated Federal Circuit decision, was based on large part, on an analysis of the claimed subject matter using the "Freeman-Walter-Abele" test.¹ Under the first part of that test for statutory subject matter, claims are analyzed to determine whether a mathematical algorithm is either directly or indirectly recited. Under the second step of the two-part test, if the claims directly or indirectly recite a mathematical algorithm, a determination is made as to whether or not the claims, as a whole, merely recite the mathematical algorithm.

Between the time of these previous decisions and the present time, the Federal Circuit has issued its decision in State Street Bank & Trust Co. V. Signature Financial Group, Inc., 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998). In our view, State

¹In re Freeman, 573 F.2d 1237, 1245, 197 USPQ 464, 471 (CCPA 1978); In re Walter, 618 F.2d 758, 766-767, 205 USPQ 397, 406-407 (CCPA 1980); In re Abele, 684 F.2d 902, 906, 214 USPQ 682, 686 (CCPA 1982).

Street is controlling in the instant case. In accordance with State Street, the applicability of the “Freeman-Walter-Abele” test “could be misleading, because a process, machine, manufacture, or composition of matter employing a nature, natural phenomenon, or abstract idea is patentable subject matter even though a law of nature, natural phenomenon, or abstract idea would not, by itself, be entitled to such protection.” State Street, 149 F.3d at 1374, 47 USPQ2d at 1601. That is, “a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program or digital computer.” Diamond v. Diehr, 450 U.S. 175, 187, 209 USPQ 1, 8 (1981).

Finally, it is apparent that the court in State Street favored a more pragmatic approach of determining whether the claimed subject matter “constitutes a practical application of a mathematical algorithm, formula or calculation.” State Street, 149 F.3d at 1373, 47 USPQ2d at 1601. The court indicated therein that the focus of a statutory subject analysis should be “on the essential characteristics of the subject matter, in particular, its practical utility.” State Street, 149 F.3d at 1375, 47 USPQ2d at 1602. These principles appear to have been reinforced in AT&T Corp v. Excel Communications, Inc., 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999).

Applying these principles to the instant claimed subject matter, we find that the

instant claims are directed to practical applications of computer-implemented methods and apparatus for planning a physical path for a physical object to follow in a physical task space and/or determining a physical motion specification for a physical object.

While mathematical algorithms may be involved in the processing of data to update a configuration space data structure, the “essential characteristic” of the subject matter, or its “practical utility,” is to plan a physical path for an object to follow in a physical task space and/or to determine a physical motion specification for a physical object. Cost waves are propagated wherein cost values representing physical aspects of the physical task space with respect to physical motion of the physical object are generated. Further, the claimed method and apparatus involve a physical element in the form of a computer readable storage medium. This is clear from the language of independent claims 1, 3, 22 and 33.

Independent apparatus claims 22 and 33 are in means-plus-function format and it is clear from the disclosure that these “means” refer to the software embodiment disclosed. The computer program provides for the claimed functions and, like the method claims, claims 22 and 33 are directed to a practical application of any mathematical algorithms recited. That is, the claims are directed to the planning of a

path for an object to follow in a physical task space by assigning cost values and

directions of travel corresponding to a physical least cost path. A series of discrete states along the physical path is determined by starting at a start state and following the cost and direction of travel values assigned to the various states. While it is true that the claims do not actually require use of the series of discrete states, which has been transformed into electronic form, since they stop short at the transformation of the series and recite only an intended use, i.e., the electronic form of the series of determined discrete states “being usable” by the object in claim 22 and the least cost path being merely identified in claim 33, the electronic signals produced are, themselves, of practical utility, in controlling the movement of an object in a path.

Moreover, all of the instant independent claims, including the method claims, recite and require a “computer readable storage medium” [claim 22 recites a “memory”] which is a physical structure. The fact that the memory, or storage medium, comprises thereon an encoded computer program does not now preclude this otherwise physical structure from constituting statutory subject matter under 35 U.S.C. § 101.

Accordingly, we will not sustain the examiner’s rejection of claims 1-15, 17-23

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and 33 under 35 U.S.C. § 101 since it is our view that the instant claims are directed to statutory subject matter.

The examiner's decision is reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ERROL A. KRASS)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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